THE WATERWAYS PROBLEM

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The report of the Inland Waterways Commission, appointed by the President in March of 1907, again calls attention to the urgent need of some drastic measures which will relieve the country from the inadequate facilities for the removal of the enormous tonnage which the nation produces. In referring to the report in his message the President characterizes it as the conservative, sane and just judgment of a body of exceptionally well qualified experts, and adds that if it errs at all it is by over-conservatism. "The subject of which it deals is of critical importance, both to the present and to the future of our country."

Being in full accord with these sentiments and realizing the urgency of a speedy conclusion which shall make provision for the opening of the magnificent systems which the United States affords for internal transportation by water, it seems appropriate

to review briefly the actual situation and the remedies suggested, not in a spirit of criticism, but with a view to an early remedy.

Although the rivers have continued to flow to the seas for many centuries and projects have been on the tapis for generations, he has aptly said that "*The rivers of no other civilized country are so poorly developed, so little used, or play so small a part in the industrial life of the nation as those of the United States.*"

The reasons for this condition are ascribed largely to "unregulated railroad competition," which has tapped the traffic at its origin and confined it to wheels, whereas it is abundantly shown by experience in all countries that the proper segregation of the bulky freights to the water routes, is the best for all interests and the greatest masters of transportation and students of economics have for many years been attempting to effect such a separation to prevent the engorgement which has been so manifest in the past.

HISTORY REDIVIVET. SECTIONALISM.

But there are other causes of great potency also which have caused the decadence in the water-borne traffic. Prior to the advent of the railroad as a competitor, there were numerous private companies chartered by the States for the improvement of the waterways as commercial enterprises, authorized to build, operate, and maintain navigable waterways, whether as canals or slack-water rivers, to sell the power stored in the dams and to charge tolls. Under these rights some 5,000 miles of canals were constructed prior to the Civil War at a cost of about $150,000,000, or an average of $30,000 a mile. A century ago the sparse population and limited capital of the States appeared to be insufficient for the great work of connecting the Great Lakes with the seaboard and the "Empire State" solicited the aid of the Nation in the form of a land grant to build the Erie Canal, but after a long discussion and many flattering promises it was finally refused because of the sectional jealousies which led the Commissioners to report to the New York Legislature, in 1811, that:

"On the 21st of December, they waited on the President of the United States (Monroe) and found him, although he expressed himself to be an enthusiast as to the advantage of interior navigation, by means of canals, embarrassed by scruples derived from

his interpretation of the constitution. At the close of their visit, however, he was in better disposition, which is evidenced by his message to Congress, of the 23d of December, copy whereof is annexed. On the 24th they attended at the Treasury office and found the Secretary desirous of performing this, and other works of a similar nature, conformably to the plan which he had reported at the precedent session. He was under the opinion that under present circumstances, pecuniary aid would not be given; but that sufficient grants of land might be made now without inconvenience to the fiscal concerns of the Union.

"Your committee found an idea prevailing with some, and sedulously inculcated on others, that it would *be wise so to amend the Constitution*, as expressly to authorize the general government to incorporate banks and *make roads and canals without the consent of the States.*

"This suggestion arose, they believe, from the desire to resuscitate the national bank. * * * Other objects were introduced rather as a convenient cover than as needful concomitants. Whatever may be the case with respect to banks, the proposed amendment, so far as regarded roads and canals, appeared to your committee to be worse than useless. * * * Your committee felt it a duty to declare, on all proper occasions, a decided opinion that the States *would not consent to vest in the National Government a power to cut up their territory, for the purpose of digging canals.*

"Your committee found another idea operating with baleful effect, though seldom and cautiously expressed. The population and resources of the State of New York furnish no pleasant reflection to men, whose minds are imbued with State jealousies; and although the proposed canal must not only be of the highest importance to the western States, as well as to the States of Pennsylvania and Maryland, and greatly promote the prosperity of the whole Union, it was obvious that an opinion of its superior benefit to this State was sedulously inculcated. An opinion which there is reason to fear will have too much influence in every consideration of this subject. * * *

"It became evident that the object of this State would not be separately attended to and your committee were desired to prepare a general system * * * they had learned, in the course of their conversation with individuals, that unless something was

*Italics by author.

done for many of the States, the consent of the majority of the House of Representatives could not be obtained." * * *

Thus a log-rolling bill covering a system of canals in most of the States of the Federal domain lying east of the Mississippi, was draughted, and it provided for the appropriation of 9,900,000 acres among the several States, of which New York's pro rata was to have been 4,500,000. The objection, however, was so great that the bill was smothered in sub-committee and New York was compelled to carry on the work from her own resources, thus securing for herself the commercial supremacy of the western world and leaving her sister States without the Federal assistance and internal development they might have secured so readily but for the narrow sectional policy which was permitted to prevail.

In closing their report the commissioners stated:

"Others, again, who have too much understanding to doubt the resources of the State, and too much prudence to expose themselves to ridicule, by expressing such doubt, triumphantly declare, that her Legislature has not the spirit and intelligence to draw out and apply her resources to that great object.

"These men console themselves with a hope that the envied State of New York will continue a suppliant for the generosity of the Union, instead of making a manly and dignified appeal to her own power. It remains to be proved, whether they judge justly who judge so meanly of our councils."

The sequel proved the wisdom of the commission in abandoning further efforts to secure national aid, and these extended extracts may point the moral which has been so oft repeated in subsequent years, of the difficulty in securing enabling legislation for the most important and meritorious national improvements, because of petty jealousies or sectionalism. It follows that under the general provisions of the Constitution and the practice existing prior to the war, that the system was working very satisfactorily and that facilities were created whenever and wherever the prospects seemed to justify a fair return on the capital, whereas at present, private capital is being paralyzed by the inhibition of tolls on waterways, while it has ever been permitted on the railroads, without which they could not exist, and the efforts to regulate the tariffs by legislation is having a direful effect. The rehabilitation of the waterways on a commercial basis would go far

to relieve the railway, while it would also add largely to its more profitable business at less cost for plant and operation.

Thus history is constantly repeating itself, but the lesson of experience appears to be lost in the ever changing personnel of the actors in the legislative and executive departments of the Government.

The present régime and the obligation under which the Government is now laboring are well stated by Senator Philander C. Knox, of Pennsylvania, in his address to the Chamber of Commerce of Pittsburgh, on February 12th, when he said:—

*"The duty of the Government to raise its waterways and harbors to their utmost efficiency was determined long ago by the action of the Government itself. * * * It invited cities to improve their docks to accommodate large ocean vessels. It held out inducements to railways to bring their tracks to the water's edge and construct terminals for the transfer of freight from cars to vessels. So when the Government assumed charge and control of the navigable streams of the interior it entered into a practical contract with the States and communities bordering these streams that their waterways would be improved to their highest capacity. The States were thereby prevented from improving the streams themselves. Corporate enterprise was forbidden to undertake the canalization of important stretches and fix the cost of their works and franchises on the traffic. The Federal Government has made its formal and deliberate declaration that it will do this work. That necessarily involves that it will make the improvements adequate to modern needs and possibilities. To do any less would be a mockery and breach of good faith."*

DEFECTS OF THE SYSTEM.

How has the Government fulfilled this duty? Let the President in his courageous and forceful message answer. He says, as already quoted, that *no rivers of any other civilized country are so poorly developed as our own.* If we look for the reasons, outside of the great interests vested in the "rival" carriers which have found it simpler and cheaper to regulate legislation than to purchase and destroy canals, we will find that the complaint is made of the wholly inadequate appropriations for the rivers and harbors

of the country. Even to-day with the great enthusiasm and thorough organizations existing from Maine to Texas and the universal demand for relief, the policy of Congress is not to pass a bill, and thus the paralysis continues while tentative works are encouraged in isolated localities notwithstanding the strenuous efforts of the committees to secure continuous appropriations for the trunk lines of traffic, and even new works are authorized in inaccessible districts where there is no commerce because of the great dangers surrounding the approaches. But is this complaint well grounded?

LACK OF INITIATIVE AND OPPOSITION BY GOVERNMENT.

In the first place although, as Senator Knox has stated, the Government has assumed the jurisdiction of all waterways or those that may be made navigable, it does not take the initiative in originating their improvement, and it is left for the localities interested to send their committees to Washington, and in many cases to retain permanent solicitors at the capital to further their interests. Thus all sections are arrayed against one another and allied with other adverse interests, and because of the demands for large appropriations for less imperative departmental services, these vital works are postponed from time to time, amounting to generations, and without national aid or consent the localities are deterred from inaugurating improvements of their own.

Not only was the Erie Canal thus opposed, but the Sault Ste Marie, the greatest portage on earth, was objected to in Congress as being "beyond the pale of civilization if not in the moon." Yet no expenditure made by the United States of equal amount has returned so vast a profit to its people or done more to promote their welfare.

The Louisville and Portland Canal was also opposed by the Government in the early part of the last century, and was finally started under a charter from the State of Kentucky issued in 1825, and built by a stock company, which subsequently released it to the United States at a large profit to the latter after earning $1,200,000 more than its entire cost.

The Delaware and Raritan, the Morris and Essex, the Schuylkill and Susquehanna, the James River and Kanawha, the Chesapeake and Ohio, and in fact practically all of the canals in the

country were built by private capital under State charters and without aid from the Government.

Since the advent of the railroad they have been purchased and exterminated to such an extent that less than fifty per cent. of the mileage has survived, and these are too small to meet the demands of modern traffic without a thorough reconstruction. Some of the wreckage of the Pennsylvania canals is shown in Fig. 1. and is indicated by the very name of the boat, which is "Complete."

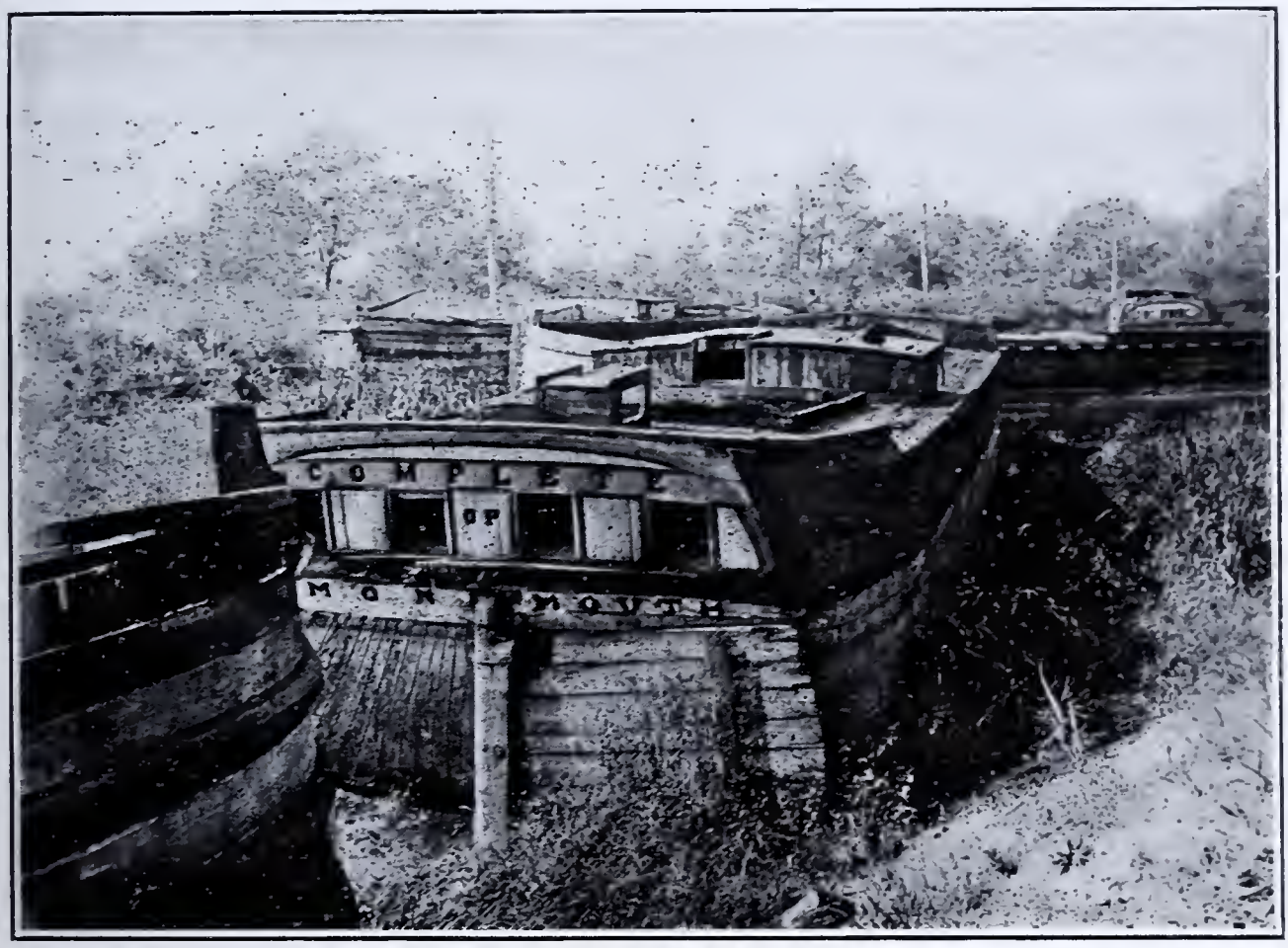

Fig. 1.

APPROPRIATIONS AND RESULTS.

A brief digest of the expenditures of the Government upon our rivers and harbors will serve to throw some light upon the efficiency of these works, regardless of the abstraction of the traffic by the railways and the great increase in the dimensions of vessels which demand channels of much greater capacity.

Up to the beginning of 1867, the total expenditures by the Government for rivers and harbors was $14,994,206.63, and yet the canal and slack-water systems had been built and were well maintained, while, since that date, the expenditures for these improvements have aggregated $559,909, 090, and the results are charac-

terized by the Chief Executive as "largely negative." "No single agency has been responsible under the Congress for making the best use of our rivers, or for exercising forethought in their development. In the absence of a comprehensive plan, the only safe policy was one of repression and procrastination. * * * In spite of large appropriations for their improvement our rivers are less serviceable for inter-state commerce to-day than they were half a century ago, and in spite of the vast increase in our population and commerce they are on the whole less used."

This pregnant paragraph contains much food for thought since it is during this period of "repression and procrastination" that these works have been almost exclusively under the control of the War Department, whose officers are prohibited by virtue of their duties and training, as well as from their temporary details at various stations and the absence of individual responsibility for the plans, from inaugurating or recommending any project; while it not infrequently happens that they are responsible for the approval of the plans for the structures over or under navigable streams designed by the common carriers who desire to retain the tonnage by blocking the waterway, which purpose would seem to have been accomplished by the statement in the report of the Commission that among the reasons for the decline of river traffic was "the adverse placement of tracks and structures, and by various other means." This is confirmed by the fact that instances are numerous where permanent steel girders or stone bridges have been erected over waterways, presumably by authority of the War Department, at so low an elevation as to debar even coal barges from supplying mills and factories with their fuel, formerly received by water, and placed upon navigable streams because of that possibility.

This bureau, which has had control of the works and plans during all this time, is perhaps unfortunately the only one which can be held accountable for the present conditions of the waterways, and after so many years of management it may be of interest to hear what the Mississippi River Commission has to say with reference to the improvements of that great drainage and navigation system to which His Excellency refers, as having at one time no rival in any country for the traffic, which has to-day almost vanished from its surface.

In the official report for the year 1903, the Commission states:

"Systematic work, which has for its object to permanently locate and deepen the channel, has not been practicable under existing conditions. In the limited extension and repair of bank protection and contraction work the Commission has, however, kept in mind that the permanent improvement of the river is contemplated by the organic act, and experiments are continually being made looking to the best use of available material and the development of appliances and methods which may be economically and effectively employed when Congress shall provide for such systematic improvement." All of which appears to imply that notwithstanding the "large appropriations for their improvement," the Commission is still unable to show any definite results until Congress shall make them still greater. But it seems that the levee system has grown enormously in height, length and breadth, and that this irregular enceinte has not had any material effect in the improvement of the channel. On this point the distinguished and patriotic ex-Senator from Arkansas, Senator Berry, said: "Under the Constitution, Congress had no power to appropriate money to protect private property. I want to say to-day that every dollar that has ever been appropriated for levees on the Mississippi River has been on the theory that it would benefit navigation, and we never dared to put it on the ground, up to this day, that it would benefit private landowners, though we knew of course that it was incidental to it."

The statement was also made freely that the effect of this protection from overflow was to advance the value of the low swamp lands as well as the uplands "all over the alluvial valley, in some places 100 per cent., in some places 200 per cent., in some places 300 per cent.," thus showing the almost irresistible inducement for large appropriations from the national treasury and their application to the construction of the levees which produced negative results upon the navigability of the low-water stages and compelled the resort to hydraulic dredges to remove the additional mud thus confined to the bed of the valley and which formerly escaped to enrich the plains and reclaim its swamps.

That the policy of "repression and procrastination" is still prevalent, is also manifested in the rules adopted by Congress prohibiting appropriations prior to a survey, although it frequently happens that all necessary data are on file in the Government offices, but by this means the works can be forestalled, from two to three

years, and the funds be applied for other purposes while the country waits, or, it may be that in the absence of definite plans and the necessity for keeping up appearances or to exclude some proposition which may be guaranteed to give the requisite channels, which other interests may not desire, the appropriations may be recommended and the contracts let in such manner as to permit of changes of plans as the difficulties are developed during the process of the work. Under this policy the proposals of Capt. Jas. B. Eads, and others, for the improvement of Galveston Harbor, the Southwest Pass, the Aransas Pass, the mouth of the Columbia River, New York entrance and other important places were rejected and many of them suppressed from the official reports to Congress. The story of the delta of the Mississippi has almost reached a crisis. After Eads was remanded to the South Pass, which is no longer equal to the demands of the traffic of the great river, the Government engineers submitted a plan for the opening of the Southwest Pass, at an estimated cost of $13,000,000 for two parallel, straight jetties. Congress was not very favorably impressed with it, since a large portion of this work was out of the water and on the marshy banks of the river, or else in deep holes of twenty or more feet, close beside the natural banks, so that a revision was ordered to meet the offer of responsible parties to create a thirty-five-foot channel, and guarantee the results, for $6,000,000.

A Board of Engineers abandoned the original plan and reported in favor of a bottle- or coffin-shaped arrangement of jetties, placed so far back from the river bed as "*to take from them the duty of forming the channel*" and placing the "*main reliance upon dredging.*" The results to be expected from this plan, with the enormous quantity of silt, amounting to over 100,000,000 cubic yards annually, which the Pass was carrying to the Gulf, was pointed out to the Board by the parties making the guaranteed proposal, but this merely resulted in a hasty modification of the location of the jetties and an appropriation for the construction on the proposed plan, of which it was stated in the report to Congress that "No contract for the superstructure should be made until experiment and experience have developed the most economical methods of construction." Also, "The construction engineer should be free, subject, of course, to the approval of the Chief of Engineers, to modify them (the plans) in all particulars, as experience may dictate."

Such were the conditions under which work was undertaken at the mouth of this sedimentary delta, with numerous precedents as a guide, and the main reliance was to be on dredging between jetties which had no duties to perform as channel formers. The work as to the jetties is now reported as completed and two hydraulic dredges have been constantly engaged in the efforts to cope with the sediment, with the result that the ruling depth is reported at twenty-two feet and the crest of the new bar is about a half-mile outside of the jetties, which have scoured a hole far deeper, between their outer portions, than was required for the channel, extending to over eighty feet, the material from which has been added to the bar beyond, and the jetties are now to be extended into the Gulf, thus flattening the slope of the river and increasing the heights of the floods and danger from crevasses.

Many such instances of tentative plans may be cited, but suffice it to point out one of a purely tidal entrance with a feeble diurnal tide upon which a Board reported in 1887 as follows:

"The problem of the improvement of the navigation of this pass (Aransas Pass, Texas) is by no means an easy one. Some of the difficulties may be mentioned, viz.: The want of stability in the position of the pass itself, which is constantly and rapidly moving under the influence of causes—winds, waves and currents—of which the action cannot be prevented and the effects only measurably neutralized; the instability of the foundations on which any structure is to be built; the shifting sand of the Texas coast, the presence in the water in which any structure must be placed of the sea-worm in such activity that wood cannot be used, except to a very limited and exceptional extent, if at all; the necessity of bringing stone, cement, etc., from long distances and at much expense; the heat and other discomforts of a tropical climate increasing the cost of labor." * * * "As the work progresses experience will probably suggest variations of detail. There is good prospect of success in deepening the channel by the use of the jetties. The location of those recommended (by the local engineer) is approved, subject to such change as further study may show to be expedient." * * * "No work should be begun unless there be on hand for expenditure a sum not less than $500,000."

Although this report was approved by the six members of the Board of Engineers, one of them dissented the next day and wrote

that he believed "one jetty would suffice at this locality," and that he "did not coincide with the views expressed in the report of the local engineer either in general application or in particular at this locality." It may be well to state that the local engineer had had but a limited experience in tidal waters prior to that date.

Under the above stated conditions and the tentative nature of the plan it would seem futile to even suggest a remedy in this case, and although the efforts made by the Government to secure even twelve feet had been a signal failure, yet subsequently private parties did submit a guaranteed proposition to create a twenty-foot channel for about one-fourth of the Government's estimate. This plan was finally taken over by Congress, as set forth in the

Fig. 2.

February number of the Franklin Institute *Journal,* and after many and serious delays and great opposition, completed in part, as shown in the illustration herein (Fig. 2), with the result of securing depths of over twenty feet along the completed portion, reaching even to twenty-six feet as a maximum, by the natural action of the currents and without dredging, yet, as shown, the Government has not permitted sufficient time to elapse for the currents to complete the channel, nor would it expend the petty sum of $6,000 to hasten the formation of the channel under the adverse conditions of an exceptional summer, but it has appropriated over a *million* dollars to return to the temporizing method of experimentation with two jetties to maintain an artificial chan-

nel to be created subsequently by dredging at an annual cost of $75,000. This is but another flagrant reason why the President seems to be fully justified in the statements he makes as to the necessities for reorganization and cöoperation in the formulation of a systematic plan for the conduct and control of the waterways of this great federal domain.

THE "NO TOLL" FALLACY.

There is somewhere an idea prevailing which has been sedulously impressed upon the public mind that *all* waterways should be free.

This is true, however, only of certain public waterways built at public expense, but had this policy prevailed from the days of the independence of the United States, where would our waterways have been in the past, and if we are not to begin any project "until the funds necessary to complete it promptly are provided and no plan once under way should be changed except for grave reasons," how soon will our internal systems be opened? The experience of legislation in the past forty years will serve to show the utter impossibility of securing the appropriations or the plants which will meet the emergencies. The plans at Panama, exploited as thoroughly as ever any engineering work was or could be in the century of investigation, are being constantly changed to meet new conditions, especially those due to enlarged capacity of vessels, which were not foreseen. The prohibition of tolls must of necessity debar many of the minor but important local projects from being undertaken by States or localities and thus check the commercial streams at their sources and play into the hands of the very interests which have so long swayed the destiny of the country in regard to traffic by restricting the growth of the cheapest known means of transportation. In the humble opinion of the writer, this error of requiring all projects to be first approved by the general government and the prohibition of tolls as a legitimate return for the expenditures of private capital in the development of the resources of the nation, would be a most serious detriment to all interests, and a violation of the fundamental principle upon which all transportation companies are based, namely, the right to collect a reasonable compensation for moneys expended for services rendered the public, by private or local interests. Such in-

hibition would debar the States from their sovereign right to grant charters to such companies and deprive the States from their usufruct from any royalties or franchises which said States may see proper to authorize for the benefit of their own citizens, which rights and powers were distinctly reserved by "the people" in the framing of the Constitution, but they seem to have been "assumed by the Government," as stated by Senator Knox.

But it is well to reserve and exercise the right to limit the terms of such corporate powers and to provide means for emancipating the avenues of trade from the tolls, so soon as the originators may have been recouped for the outlay or the tolls become a burden in restraint of inter-state commerce. It may be germane to inquire whether the Panama Canal is to be exempt from tolls when completed, and if so, is the expenditure so largely in behalf of foreign nations justified while our domestic waterways are denied the vitalizing appropriations? Is the Suez Canal free? No. Why not? for it has paid for itself many times over.

In short, the system which would appear to furnish the most speedy relief would be approximately one which would confine the national appropriation to the trunk-line waterways for inter-state commerce; such as applies to the great rivers, the lakes and the intercoastal systems, with the important harbors of the lakes and the seaboard and such canals as constitute necessary links in the great chain of internal communications, for which a liberal minimum of draught should be fixed and the works be placed under permanent, resident and division engineers, who should be held strictly accountable for results, as was outlined in the legislation as proposed in the Cullom-Breckinridge bills of 1886-7. These should be amended, however, to meet present exigencies and to eliminate the need of special legislation as far as possible in the inauguration and conduct of these works.

COMMISSIONS VS. INDIVIDUAL RESPONSIBILITY.

During the inception of the plans and their evolution to a completed project a commission of experts may be of great value, especially where many subdivisions of science and art are involved; as hydraulics, sanitation, mechanics, electrics, organization, finance, administration, etc., yet these requisites are not always simultaneous but arise in sequence and after a general

project is well matured it would seem best to refer the details to some one or more responsible individuals to work out as the local exigencies may demand. Thus is avoided the generalization and shifting of responsibility which invariably accompanies the ever changing personnel of a Board composed of men whose succession in office or change of station necessitates rotation in duties, and lack of familiarity with details which are often vital, while experiments and changes of plan are expensive and frequently unnecessary, if the problem is well exploited in advance. Moreover, the removal of a competent official by reason of an age limitation at a time when his experience is most valuable is opposed to good policy.

The various isthmian canal commissions and the conflicting plans and estimates which they submitted will serve to illustrate the difficulty of securing the most direct results from a large body of experts, so that it has been found necessary to reduce the personnel until it is now a minimum, and the work is progressing rapidly under the admirable system which has been developed on the isthmus in the past few years.

It is true that there are many factors incidental to the development of navigable channels, such as the amount of rainfall, the rapidity with which the excess reaches the stream, the topography of the district, the extent of its forests, the character of its soils, its stratigraphy, the extent of its drainage basin, the obstacles which beset its discharge, the alignment of the path and the character of its outlets and tributaries. Some of these elements are so remotely connected with the mere question of capacity of channel for navigation that it would seem greatly to complicate the issue, to involve the prompt relief from obstructions, in a general consideration of all these collaterals. River regulation is one of canalization and preservation of uniformity of flow as well as of the abstraction of sediment from the bed, either by prevention at the intakes, relief at outlets, or removal and impounding *en route*.

These are questions pertaining to the profession of the civil and hydraulic engineer, the general principles of which are readily understood and applied, and what it immediately desired is not elaborate research into the intricate, complicated relations of trade or commerce by various media so much as the enabling legislation and release from the restrictions which have of late impeded the

free application of local resources to the creation of better transportation conditions. Even now contracts are being taken for vessels of 1,000 feet length and forty feet draught—yet there are few harbors in the world where such a steamer can berth beside the dock.

Judging from the results secured by the Bureaus of Irrigation and Forestry it would seem that the present organizations are working very effectively and harmoniously under their executive heads and that the work done tends incidentally to the conservation of both the water and sediment to keep the latter from the stream-bed and retard the flow of floods, for the benefit of navigation during low stages. The establishment of reservoirs for irrigation or for power will incidentally restrict the storm flow, as do the great Alpine lakes of Switzerland, and discharge the clarified effluent for navigation or for domestic or manufacturing purposes.

The question of the sale of the power thus stored within the States or territories, by the Government, is one which must be left for adjustment in future, but like many others of similar import, it can better afford to wait than can the more urgent, nay even vital one of the navigability of the streams.

OBSTACLES TO DEVELOPMENT.

From this brief review of the situation it appears that the main causes which have resulted in the decadence of the waterways of this nation and the traffic upon those that still remain in service are:

1. The growth of railways and the attempts of legislators to tax their tonnage in support of their competitors, the canals, previously chartered.

2. This led to reprisals to exterminate the waterways, resulting in the focussing of their control in a single legislative body at the national capital where the situation could be more readily handled and where the river and harbor, as well as many other bills, were made subordinate to the policy of the regnant administration under the Committee of Rules, which in turn is appointed by the Speaker. A consequence of this mechanism was a delay in the opening of a canals across the isthmus of Darien for nearly a century after the first American company had been chartered

for the purpose. Also the postponement of work upon the Hennepin and other canals for many years, as well as the delays in the improvement of the Ohio, Mississippi, and other rivers, because of the pressure from antagonistic interests, which could be so readily applied, to defeat legislation, on the pretext of economy or more urgent use of funds.

3. These forces were also allied to local and sectional jealousy which demanded an equal share in the distribution of the public patronage, as a consideration for approval, and hence the admissions frequently made that the small appropriations for isolated improvements were necessary to secure the passage of the bills.

4. A fourth cause is the fact that the Government does not take the initiative in making any improvements and often goes so far as to oppose the inauguration of much needed new work and of prohibiting localities from undertaking it at their own expense. In fact, one of the officers of the Corps of Engineers made the significant statement as to the reason for lack of progress that "We are forbidden, and properly so, from urging appropriations for new works, and are limited solely to giving our views and estimates, when asked to do so, by the proper authority."

One may well wonder how soon all the work of this great country, with its extended insular possessions, would be improved if the head of the Department at Washington must first initiate an inquiry as to what may happen to be needed in some remote part of the federal domain and the report must be transmitted through a succession of local officers and Boards, for examination, report, and final approval by a single individual before even an appropriation may be requested from the national treasury for a survey, while the local interests, if not restricted, would have successfully completed the work in many cases at their own cost, pending this circumlocution. Neither the Erie Canal nor the Sanitary District Canal of Chicago would have been built but for the State initiative, and many other States are to-day organizing improvement associations for the immediate completion within their borders of their own lines of traffic by water, by reason of their necessities.

5. Another cause may be found in the onerous conditions attending the execution of Government contracts, which make it difficult to find the sureties required and which have caused the failure of such guarantors from the arbitrary interpretations

imposed by incompetent inspectors placed upon the works and whose orders are absolute, which conditions add largely to the cost of Government works and thus tend to limit the benefits and extent of the appropriations.

6. The policy of rejecting or suppressing thoroughly guaranteed proposals for the opening of rivers and harbors under bonds for the successful completion of the works and for payments to be made only as the channels are obtained, is believed to be another serious cause for the absence of greater depths which could be secured by the use of the energy stored in currents of the rivers or in the tides of the seas.

None of the above causes are physical, but they are incidental to legislation, and as soon as our legislators and others can see their way to adjust them so as to open the door to a general movement for work all along the line, just so soon will the facilities begin to be provided on a scale commensurate with the needs of a great and industrious nation.

TWO SIDES TO "CÖOPERATION."

The proposition to cöoperate with interests not now aggressively taking part in these improvements is an excellent and desirable one, but it has been sadly perverted. In former times, under the old régime, it was the Government that occasionally cöoperated with the States by contributing to some of the works undertaken under their charters and thus becoming a partner in the corporations thus organized, as in the case of the Chesapeake and Delaware Canal Company, in which the United States is still a shareholder; but in more recent days the tables are turned, and cöoperation appears to mean a contribution from the locality desiring improvements to the extent of large appropriations made to the Treasury of the United States to induce it to inaugurate the necessary improvements, and yet even this is not always effective in securing even a survey for deeper channels, although the entire expense thereof may be borne by the locality. This is the kind of cöoperation which places all the funds and all control in the hands of the centralized authority without producing the desired relief and is not such as would improve the situation physically.

It will be many years before the physical data and the various conditions affecting our economic resources can be collected and

thoroughly digested and formulated, by which time the growth of the population and its productivity will have again modified extensively the then existing conditions so that it would appear to be of great importance to frame some general legislation as a basis for the general development of navigable channels at the earliest moment and make provision for a permanent and radical policy of conducting our public civil works if this generation is to derive any benefit from the movement.

In the Preliminary Report as submitted, although signed by all the members, it appears that there were dissenting views as to how its findings should be rendered effective, and the appendix submitted by Senator Newlands, the earnest and successful advocate of the irrigation and reclamation projects, are so pertinent that they deserve the attention of all good citizens, interested in the welfare of the nation. What the Senator says in his supplementary report is this:

"I desire to emphasize my belief that it is of the highest importance that in dealing with subjects relating to the respective powers, rights and interests of the Nation, States, municipalities, corporations and individuals, large powers and a comparatively free hand should be given to an administrative body of experts in the full development of projects, lest the complexity of the transactions, the time necessary to secure Congressional approval, and the difference of view as to purpose or method, may result in indecision and delay, the worst enemies of effective development.

"An ample fund should be provided, to be reinforced from time to time either by the legislative appropriation or by bond issue, and the administrative board or commission should be given power, not only to investigate projects, but also, when determined to be feasible, to enter, with the approval of the President, upon their immediate execution; but the power should be limited so as to prevent such administrative body from entering into any contract unless there are sufficient moneys in the fund to meet the cost thereof.

"Unless some method of construction and development, insuring prompt decision and execution and continuous and consecutive work by a body of experts is adopted, I fear that the best of projects may be wrecked in the shoals and quicksands of legislation."

This fear has been confirmed by past experience, time and

again, and it would seem to meet the situation fully to adopt the policy of awarding contracts to any responsible parties who may volunteer to bid upon a guaranty of payments for results secured within reasonable time limts, in which case no risk is taken by the Government and there is an immediate return for the moneys expended. In the few instances where this policy has been tried, the results were eminently satisfactory, but the precedents were not followed by Congress because of the opposition of the "system."